

Algebra II Trig Review 13.1 – 13.3

Name Key

I. Use the given triangle to find the following trig ratios. soh cah toa

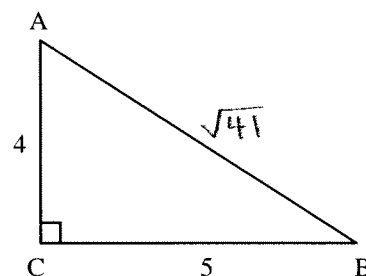
1. $\sin A = \frac{5\sqrt{41}}{41}$ 2. $\cos B = \frac{5\sqrt{41}}{41}$ 3. $\tan B = \frac{4}{5}$

4. $\sec A = \frac{\sqrt{41}}{4}$ 5. $\cot A = \frac{4}{5}$ 6. $\csc B = \frac{\sqrt{41}}{4}$

$\cos^{-1} \frac{b}{a}$

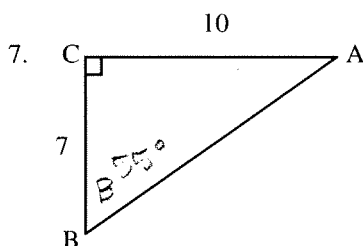
$\frac{a}{0}$

$\frac{b}{0}$



$4^2 + 5^2 = AB^2$
 $16 + 25 = 41$

II. Solve each triangle. Angles to the nearest degree and sides to the nearest tenth.



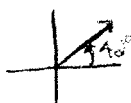
$\angle B = 55^\circ$ $\tan B = \frac{10}{7}$
 $b = \tan^{-1}(\frac{10}{7})$

$\angle A = 135^\circ$
 $180 - (70 + 55)$
 $AB = \sqrt{149}$

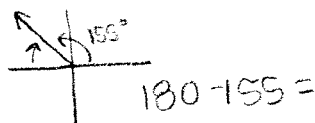
$7^2 + 10^2 = AB^2$
 $49 + 100 = AB^2$

III. Find the reference angle.

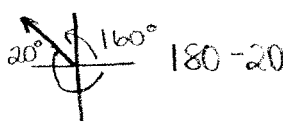
9. 42° 42°



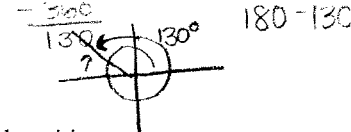
10. 155° 25°



11. -200° 160°



12. 490° 50°



IV. Find the exact value of the following trig functions given each point on the terminal side of θ in standard position.

13. $(-1, 4)$ $r = \sqrt{(-1)^2 + (4)^2} = \sqrt{17}$

$\sin \theta = \frac{4}{\sqrt{17}}$
 $\cos \theta = \frac{-1}{\sqrt{17}}$
 $\tan \theta = \frac{4}{-1}$

14. $(-6, -8)$ $r = \sqrt{(-6)^2 + (-8)^2} = 10$

$\sin \theta = \frac{-8}{10} = -\frac{4}{5}$
 $\cos \theta = \frac{-6}{10} = -\frac{3}{5}$
 $\tan \theta = \frac{-8}{-6} = \frac{4}{3}$

15. $(7, -2)$

$r = \sqrt{7^2 + (-2)^2} = \sqrt{53}$
 $\sin \theta = \frac{-2}{\sqrt{53}}$
 $\cos \theta = \frac{7}{\sqrt{53}}$
 $\tan \theta = \frac{-2}{7}$

$r = \sqrt{7^2 + (-2)^2} = \sqrt{53}$
 $\sin \theta = \frac{-2}{\sqrt{53}}$
 $\cos \theta = \frac{7}{\sqrt{53}}$
 $\tan \theta = \frac{-2}{7}$

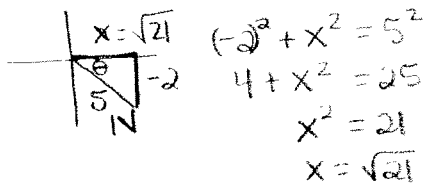
$\sin \theta = \frac{y}{r}$

$\cos \theta = \frac{x}{r}$

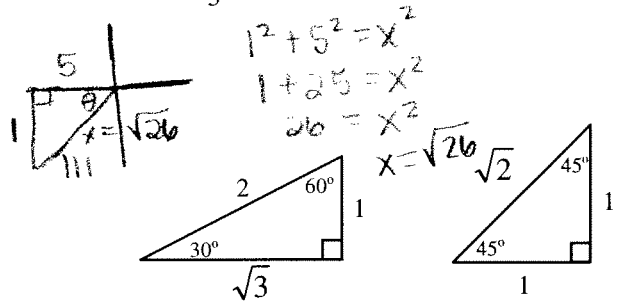
$\tan \theta = \frac{y}{x}$

V. Given the quadrant of θ in standard position and a trigonometric function value of θ , find the exact values for the indicated functions.

16. IV, $\sin \theta = \frac{-2}{5}$; $\cos \theta = \frac{\sqrt{21}}{5}$



17. III, $\tan \theta = \frac{1}{5}$; $\cos \theta = \frac{5}{\sqrt{26}} = \frac{5\sqrt{26}}{26}$



VI. Find each trigonometric function value. Give exact answers!

UNIT CIRCLE!

18. $\sin 45^\circ = \frac{\sqrt{2}}{2}$

19. $\cot 30^\circ = \frac{\sqrt{3}}{1}$

20. $\cos 210^\circ = \frac{-\sqrt{3}}{2}$

21. $\sin -240^\circ = \frac{\sqrt{3}}{2}$

22. $\sec 135^\circ = \frac{\sqrt{2}}{1}$

23. $\tan 480^\circ = -\sqrt{3}$

24. $\cos 315^\circ = \frac{\sqrt{2}}{2}$

25. $\tan 225^\circ = 1$

VII. Answer the following questions.

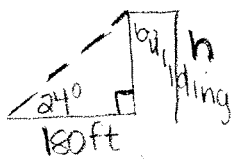
Are the following angles coterminal?

26. 42° and -42° no

27. 25° and 385° yes

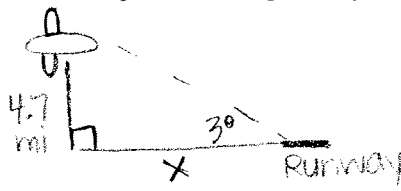
28. 140° and -220° yes

29. You are 180 feet from the base of a building. The angle of elevation to the top of the building is 24° . Find the height of the building.



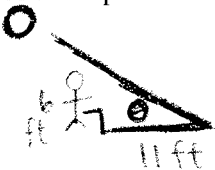
$\tan(24) = \frac{h}{180}$
 $.4452 = \frac{h}{180}$
 $.4452(180) = h$
 $80.1 = h$
80.1 ft

30. A plane is flying at an altitude of 4.7 miles. The pilot wants the plane's path to make an angle of 3° with the runway. How far from the airport must the pilot begin descending?



$\tan(3) = \frac{4.7}{x}$
 $.0524 = \frac{4.7}{x}$
 $.0524(x) = 4.7$
 $x = 89.7 \text{ miles}$

31. A 6 foot person casts a shadow of 11 feet. What is the angle of elevation of the sun?



$\tan \theta = \frac{6}{11}$
 $\theta = \tan^{-1}\left(\frac{6}{11}\right)$
 $\theta = 28.6^\circ \approx 29^\circ$